

# REMARKS ON THE SYNONYMY OF CERTAIN TRISTOMATID TREMATODE GENERA.

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Whilst engaged in the study of some tristomatid trematodes, it became necessary to examine the validity of certain generic names which have become widely used and applied very differently by various authors. As the result seems to necessitate the sinking of some well-known names into synonymy, a sketch of the history of the genera involved appears advisable. These are *Phylline*, *Capsala*, *Phyllonella*, *Epibdella*, *Tristoma*, and *Benedenia*.

The confusion in regard to some of them has been referred to briefly by MacCallum (1927). In 1815 Oken used the name *Phylline* to designate a new genus which included *P. diodontis* Oken, *P. hippoglossi* Müller, and *Hirudo grossa* Müller, his diagnoses being republished by MacCallum (1927). This generic name was widely used by subsequent authors for parasites generally referred to as *Epibdella* spp., but it had been employed by Abildgaard in 1790 for a monozoic cestode, now known as *Caryophyllaeus*, and, therefore, not available for Oken's species.

The account and figures of the first-named species, *P. diodontis*, were based on those of La Martinière (1787, 1798) whose material was obtained from *Diodon* on the west coast of North America by the La Perouse Expedition. The description shows it to have been a tristomatid. Bosc, however, had previously (1811) given the name *Capsala martinieri* to the parasite, describing the genus as new.

The second, *P. hippoglossi*, which has commonly been regarded as the type of the genus, was based on *Hirudo hippoglossi* Müller (1776). The third, founded on *H. grossa* Müller (1788) is not a trematode, but a parasitic nemertine (*Malacobdella*).

In 1817 Cuvier, in his "Regne Animal," vol. 4, erected the genus *Tristoma*, describing and figuring one species, *T. coccineum*. Next year Lamarck (1818, 295) gave a summary of *Phylline*, mentioned the synonymy of *P. hippoglossi*, and stated his belief that the parasites were related to *Polystoma* instead of Annelids (leeches), where they had been allotted. He also referred to Blainville's manuscript name, *Entobdella*, for the genus, but retained Oken's *Phylline*. The reference was quoted erroneously by Braun (1889) as appearing in Lamarck's vol. i., p. 444, and subsequently (1890, 518) he indicated the genus with the date 1815 (when vol. i. appeared) as a synonym of *Epibdella*. Stiles and Hassall (1908, 251) credit *Entobdella* to Audouin 1828, whereas Agassiz (1845) and Scudder (1884), in their respective Nomenclatores Zoologici, attribute it to Blainville, but without mentioning a date. Sherborn, in his Index Animalium, gives the correct date (1818) for *Entobdella* (Blainville MS.) Lamarck. It was not mentioned by Rudolphi (1819), and has remained practically unrecognised since.

Rudolphi (1819, 427-30) mentioned the work of Oken and Cuvier, but accepted Cuvier's genus and described a new species, *T. maculatum* (p. 430), quoting in the list of synonyms, La Martinière's account and figures, *Phylline diodontis* Oken, and *Capsala martinieri* Bosc. Since Cuvier's and Rudolphi's species are con-generic, *Capsala* Bosc obviously has priority over the better known

name *Tristoma*, and the family Tristomidae or Tristomatidae should be known as Capsalidae Baird, and the Tristomatoidea and Tristominae as Capsaloidea and Capsalinae, respectively. Poche's term (1926, 108) Tristomatides, substituted for Tristomeae Tasch., becomes Capsalides or Capsaleae.

In 1826 Baer subdivided Oken's genus into two sub-genera, *Tristoma* and *Nitzschia*, the latter being new, with *N. elegans* Baer as the only species. His three generic diagnoses were republished by Braun (1890, 527). The species was a renaming of *Hirudo sturionis* Abildg (1794), hence its correct name is *N. sturionis* (Abildg) Kroyer 1852. In the same year Nitzsch (1826) described *Tristoma elongatum* (= *Nitzschia sturionis*) and referred to *Capsala martinieri*.

In 1827 Blainville<sup>(1)</sup> erected *Epibdella* to receive *Phylline hippoglossi* (Müller). In 1840 Nordmann transferred the species of *Tristoma*, including *T. elongatum* N. to *Capsala*. In 1843 Rathke renamed Müller's species as *Tristoma hamatum*, including in its synonymy *Hirudo hippoglossi* Müller, *Phylline hippoglossi* Oken, and *Ertobdella hippoglossi* Blainville. Stiles and Hassall (1908) query the last-named generic name as having been intended for *Entobdella*.

In 1850 Diesing placed *Epibdella* as a synonym of *Phylline* and included under *P. hippoglossi*, Rathke's species along with others above-mentioned. He also ranked *Capsala* Bosc and *Phylline* Oken (in part) as synonyms of *Tristoma* and recognised *Nitzschia* as valid. The last-named three, together with certain other genera, were grouped in a family, Tricotylea. In 1853 Baird used the family name Capsalidae and restored *Capsala* Bosc, including *Phylline* Oken, *Tristoma* Cuvier and *Nitzschia* Baer as synonyms. He listed two species, *C. coccineum* (Cuv.) and *C. elongata* (Nitzsch), placing *Phylline hippoglossi* Oken and *Hirudo sturionis* Abildg under the latter as synonyms.

In 1856 van Beneden described and figured a new species of *Epibdella*, *E. sciaenae*, and mentioned the characters differentiating the genus from *Tristoma*, viz., the large ventral sucker provided with hooks, but devoid of septa; the weakly-developed anterior suckers; and the undivided testes. In 1858 Diesing founded a new genus, *Benedenia*, to receive *Ep. sciaenae*, which he renamed *B. elegans* Dies.

In the same year van Beneden, who did not recognise the validity of the genus named in his honour, restored *sciaenae* to *Epibdella*, gave a further account of it and of *Ep. hippoglossi*, and published a generic diagnosis, which was reprinted by Braun (1890, 527) and Goto (1894, 233), both of whom then amended it. He did not differentiate between the two types of anterior suckers represented by the two species, and he included the presence of regularly-arranged papillae on the posterior sucker as a generic character. He also established the family Tristomidae (Tristomides) for *Epibdella*, *Tristoma* and *Udonella*. In 1863 both species of *Epibdella* were referred to by Beneden and Hesse, and the genus, together with *Nitzschia*, *Encotyllabe*, a new genus *Phyllonella* (type *P. soleae* Ben. and Hesse) and some others, was placed in Tristomidae, while *Udonella* was removed from it. The diagnosis and figures of *Phyllonella* were republished by Braun (1890), the chief difference separating it from *Epibdella* being the character of the anterior fixing organs which in the former are broad, thin, and folded, though serving as suckers.

In 1865 Johnston referred to *hippoglossi* under *Entobdella*. In 1877 Vogt gave an account of the reproductive system of *Phyllonella* and mentioned

(1) The date 1828 is usually quoted, but Sherborn (Index Animalium, pt. ix., 1926, p. 2169) recorded the genus as having been published by Blainville in Dict. Sci. Nat., vol. xlvii., 1827, p. 269, and in vol. lvii., 1828, p. 567.

that the genus was only slightly differentiated from *Epibdella*. Next year Taschenberg (1878) incorporated a large number of genera, including *Epibdella*, *Benedenia*, *Phyllonella*, *Encotyllabe*, *Nitzschia*, etc., under *Tristomum*. A similar attitude was expressed by him in the following year (1879) in his account of certain species of *Tristoma*, where he mentioned *Tristomum* (*Epibdella*) *hippoglossi* Oken, *T. (Epibdella) sciaenae* Ben., and *T. (Phyllonella) solea*; and quoted *Nitzschia elegans* Baer as *Tristomum elongatum* Nitzsch.

In 1888 Monticelli referred to the two species of *Epibdella* and to *Phyllonella*. He termed the anterior adhesive organ of the latter a "pseudoventosa" to emphasise its difference from that of *Epibdella*. A summary of earlier classifications of trematodes was given, and a protest made against Taschenberg's suppression of so many genera belonging to the Tristomidae. He accordingly restored *Nitzschia*, *Epibdella*, *Placunella*, *Phyllonella* and *Trochopus* to generic rank. He stated that Vogt's *Phyllonella solae* (nec. Ben. and Hesse) was identical in structure with *Ep. hippoglossi* as described by Beneden, and regarded *Benedenia* Diesing and *Phylline* Oken as synonyms of *Epibdella* (pp. 86-7 and footnote). He proposed a system of classification in which the family Tristomeae Taschenberg was subdivided into four sub-families: (1) Tristomidae Ben., containing *Nitzschia*, *Epibdella*, *Phyllonella*, *Trochopus*, *Placunella*, *Tristomum* and *Acanthocotyle*; (2) Encotyllabidae Montic. (with *Encotyllabe*); (3) Monocotylidae Tasch.; and (4) Udonellidae Ben. and Hesse. In his key to the genera (p. 97), the essential difference indicated between *Epibdella* and *Phyllonella* lay in the structure of the anterior adhesive organs.

In 1889 Linstow described *Phylline hendorffii*. About this time Braun (1889-1890) began to publish his work on the trematodes as part of Bronn's Tierreich. Figures of earlier authors relating to *Epibdella hippoglossi*, species of *Tristoma*, *Nitzschia*, *Phyllonella* and other genera were reproduced, and diagnoses of the sub-family Tristomidae and of its constituent genera were given (1890, 526-530). The generic characters regarded as separating *Epibdella* and *Phyllonella* were those already referred to. He rejected *Capsala* as being unidentifiable; regarded *Phylline* Oken as a synonym of *Epibdella* or of *Tristoma*; and quoted *Entobdella* Lamarck, 1815, as synonymous with *Epibdella*; while *Benedenia* was not recognised because erected without sufficient justification. Mention was also made that Monticelli (1890) regarded *Phyllonella soleae*, as described by Vogt, as a synonym of *Epibdella hippoglossi*, and hence *Phyllonella* might be identical with *Epibdella*.

In 1891 Monticelli gave an account and published figures of the three known species of *Epibdella* (*hippoglossi*, *sciaenae* and *hendorffii*). In 1894 Goto dealt with the anatomy of many heterocotylcan trematodes, including two new species of *Epibdella*, *E. ishikawae* and *E. ovata*. He gave a diagnosis of the genus, amending that of Beneden, and transferred *Phylline hendorffii* to it, as Monticelli had done previously. He followed Braun in disregarding *Benedenia* as valid.

In 1895 Parona and Perugia described *Phylline monticellii* from *Mugil auratus*. Perrier (1897), in his synopsis of trematode genera, placed nine of them, including *Epibdella*, *Phyllonella*, *Encotyllabe*, *Nitzschia* and *Tristoma*, in the sub-family Tristominae, separating the first and second according to the character of the anterior adhesive organs. In 1898 St. Remy published a synopsis of the recently described species of *Epibdella* and various other monogenetic trematodes.

In 1899 Goto re-examined *E. hippoglossi* and transferred it to *Phyllonella*, since the anterior organs were found to mark the ventrolaterally folded outlets of the ducts of a single mass of dorsally-placed gland cells. He retained *Epibdella*

for related species possessing well-developed anterior suckers, and gave a brief account of *E. sciaenae*, pointing out that there was a single aperture for the common genital pore and the vagina, whereas in all other species of *Epibdella*, *Phyllonella* and *Tristoma* the two terminated separately.

In 1900 Linton published a brief account of *E. bumpusii* from a stingray, and mentioned that the anterior suckers were crossed by about twenty-two ribs. His figures indicate an elongated glandular rather than a circular muscular anterior adhesive organ. The vagina and common genital pore open together in this species. In the same year Pratt included *Tristoma*, *Nitzschia*, *Epibdella*, *Phyllonella*, and three other genera in Tristominae, excluding Encotyllabe (Encotyllabinae). He separated *Phyllonella* and *Epibdella* according to the structure of the anterior organs, Linton's species being retained in the latter genus. In the same year Scott (1900) gave a brief account of *E. hippoglossi* and *Phyllonella soleae*, publishing a figure of the latter and recording both as parasites of certain flatfish in Scottish waters.

In 1901 Monticelli described *E. (Phylline) diadema* from a ray and subdivided the genus into two subgenera, *Phylline* Oken and *Benedenia* Diesing, including in the former *E. hippoglossi* Müller, *E. soleae* Ben. and Hesse, *E. bumpusii* Linton, and *E. diadema* Montic.; while *E. sciaenae* Ben., *E. hendorffii* Linstow, *E. ovata* Goto, *E. ishikawae* Goto and *E. monticellii* Parona were assigned to *Epibdella* (*Benedenia*).

In 1902 Heath gave a detailed account of *E. squamula*. Next year Linstow (1903) described *E. producta* and followed Monticelli (1901) in retaining the same five species under *Epibdella* (*Benedenia*). In the same year Monticelli placed *Epibdella* in a new sub-family, Ancyrocotylinae, Tristomidae (*vide* Stiles and Hassall 1908, p. 252), and in 1904 he transferred Heath's species to the sub-genus *Phylline*. Next year Odhner (1905) dealt with *E. hippoglossi* and pointed out that Monticelli's sub-genera *Phylline* and *Benedenia* were generically distinct, but that the former name, though older than *Epibdella*, must be reserved for *P. diodontis* Oken (= *Tristoma maculatum* Rud.) and was wrongly used by Diesing and Linstow. He, therefore, restricted the name *Epibdella* to the four species listed by Monticelli (1901) under *Phylline* (*hippoglossi*, *soleae*, *bumpusii*, and *diadema*), together with *E. squamula*, while the name *Benedenia* was utilized for the remainder. In 1906 he pointed out that *E. producta* Linstow was a synonym of *E. soleae*. In the same year Luhe described *E. (Benedenia) macrocolpa*. In 1907 Monticelli discussed the relationship of *Encotyllabe* to the other genera of Tristomidae, including *Epibdella*; and in 1908 the relationship of *Nitzschia* to these same genera. In 1915 Nicoll listed *E. hippoglossi* and *E. soleae* (Ancyrocotylinae) in his census of recorded British marine trematodes. In 1916 Cohn described *Phyllonella steingroveri* from an African fish.

In 1927 MacCallum reviewed, to some extent, the history of *Phylline*, *Epibdella* and *Phyllonella*. He retained the second and third of these names in place of *Phylline* and *Benedenia*, whose use Monticelli had previously suggested. To *Epibdella* were assigned *sciaenae*, *monticellii*, *ishikawae*, *ovata*, *macrocolpa*, *hendorffii*, and a new species, *E. melleni*; while under *Phyllonella* were placed *hippoglossi*, *soleae*, *diadema*, *bumpusii*, *squamula*, and *steingroveri*.

#### SUMMARY.

From the foregoing it will be seen that *Capsala* Bosc should replace *Tristoma* Cuvier, with consequential changes in the family, sub-family and other group names to Capsalidae, Capsalinae, etc.; that *Entobdella* Blainville, with *Ent. hippoglossi* Müller as type, should be substituted for *Epibdella* (s. str.) Blainville; and that *Benedenia* Diesing, with *B. sciaenae* (Beneden) as type, is valid.

To *Entobdella* belong also *Ent. solcae*, *diadema*, *bumpusii*, *squamula*, and *steingröveri*; to *Benedenia*, *B. sciaenae*, *monticellii*, *ishikawae*, *ovata*, *macrocolpa*, *melleni* and *hendorffi*.

#### *Subdivision of Entobdella and Benedenia.*

The position of the vaginal aperture in relation to the common genital duct would permit a subdivision of each of these genera into subgenera. In *Ent. bumpusii* and *B. sciaenae* they open together. In *B. macrocolpa* the vagina opens beside the common genital pore, but travels posteriorly behind the testes and then forwards to the vitelline reservoir. In the remaining species the vagina, when present, opens elsewhere on the left side of the midline, but it is quite likely that in those cases where it has not been mentioned or has been reported as absent, that it is extremely short, opening to the exterior in the vicinity of the vitelline reservoir. We may then subdivide *Entobdella* into the following subgenera, *Entobdella* (s. str.) and *Parepidella* (new subgenus), allotting the species as follows:—*Ent. (Ent.) hippoglossi* (type), *solcae*, *diadema*, *squamula*, and *steingröveri*; *Ent. (Parepidella) bumpusii* as type of the subgenus. The species of *Benedenia* may be grouped into three subgenera: *Benedenia* (s. str.), for *B. (B.) sciaenae*; *Benedeniella*, n. subgen., for *B. (Benedeniella) macrocolpa* as type; and *Parabenedenia*, n. subgen., for the remaining species, *B. (P.) ovata*, *ishikawae*, *monticellii*, *melleni*, and *hendorffi*, with *B. (P.) ovata* as type.

#### The genus MACROPHYLLA Kent.

In 1928 Miss Kent Hughes described a new genus *Macrophylla*, type *M. antarctica* Hughes, from a Victorian shark, *Mustelus antarcticus*. It was stated that its nearest ally was *Tristomum*, from which it was differentiated by possessing two compact testes; only five distinct radii in the disc; and glandular membranes at the anterior end, in place of suckers. The name was already pre-occupied by *Macrophylla* Hope, 1837. *Macrophyllida* is suggested as a new name for it. A detailed account of the parasite will be published later.

The synonymy of the genera referred to in this paper may be tabulated thus:—*Entobdella* (Blainville MS. in Lamarck, 1818); type, *E. hippoglossi* (Müller, 1776) Blainville, 1818.

*Syns. Capsala*—Baird, 1853 (in part).

*Entobdella*—Lamarck, 1818; Johnston, 1865.

*Epibdella*—Blainville, 1827; Beneden, 1856; Braun, 1890; Heath, 1902; Linstow, 1903; Linton, 1900; Monticelli, 1890, 1901, 1902; Nicoll, 1915; Odhner, 1905; Perrier, 1897; Pratt, 1900; Scott, 1901.

*Epibdella (Phylline)*—Monticelli, 1901.

*Ertopdella*—Rathke, 1843.

*Hirudo*—Müller, 1776 (in part).

*Phylline*—Oken, 1815 (in part), *nec.* Abildg, 1790; Lamarck, 1818; Diesing, 1850; Johnston, 1865; Linstow, 1889, 1903; Monticelli, 1901, 1904, 1905; Parona and Perugia, 1895; Sonsino, 1891.

*Phyllonella*—Beneden and Hesse, 1863; Braun, 1890; Goto, 1899; Monticelli, 1888; MacCallum, 1927; Perrier, 1897; Scott, 1901.

*Tristomum*—Taschenberg, 1878 (in part).

*Tristomum (Epibdella)*—Taschenberg, 1879 (in part).

*Tristomum (Phyllonella)*—Taschenberg, 1879.

*Benedenia* Dies., 1858; type, *B. sciaenae* (Ben., 1856) Linstow, 1903.

Syns. *Benedenia*—Monticelli, 1901; Odhner, 1905.

*Epibdella*—Beneden, 1856 (in part); Braun, 1890; Goto, 1894 (in part), 1899; MacCallum, 1927; Monticelli, 1888; Parona, 1896.

*Epibdella* (*Benedenia*)—Linstow, 1903; Luhe, 1906; Monticelli, 1901.

*Phylline*—Linstow, 1889 (in part).

*Tristomum*—Taschenberg, 1878, 1879 (in part).

*Tristomum* (*Epibdella*)—Taschenberg, 1879 (in part).

*Nitzschia* Baer, 1826; type, *N. sturionis* (Abildg, 1794), Kroyer, 1852.

Syns. *Capsala*—Baird, 1853 (in part); Nordmann, 1840 (in part).

*Hirudo*—Abildg, 1794 (in part).

*Phylline*—Oken, 1815 (in part).

*Tristomum*—Taschenberg, 1878, 1879 (in part).

*Capsala* Bosc, 1811; type *C. martinieri* Bosc, 1811.

Syns. *Capsala*—Blainville, 1828; Johnston, 1865; Nordmann, 1840 (in part).

*Phylline*—Oken, 1815 (in part).

*Tristoma* (*um*)—Baer, 1826; Beneden, 1858; Cuvier, 1817; Diesing, 1850; Rudolphi, 1819; Taschenberg, 1878 (in part), 1879 (in part); and of subsequent authors.

The species of *Capsala* at present known are:—*C. martinieri* Bosc; *biparasitica* (Goto); *coccinea* (Cuv.) Blainv.; *cornuta* (Verrill); *foliacea* (Goto); *interrupta* (Montic.); *laevis* (Verrill); *levinsini* (Montic.); *megacephala* (Linst.); *megacotyle* (Linst.); *molae* (Bl.) apparently = *C. cephalae* Risso, 1826; *nozawae* (Goto); *onchidiocotyle* (Setti); *papillosa* (Dies.) Nordm.; *pelamydis* (Tasch.); *perugiai* (Setti); *sinuata* (Goto); *squali* (Bl.); and *uncinata* (Montic.).

*Macrophyllida* T. II. Johnston, 1929; type, *M. antarctica* (Hughes) Johnston.

Syn. *Macrophylla* Kent Hughes, 1928, *nec*. Illope, 1837.

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